

PERSONALITY PATTERNS AND  
PSYCHOLINGUISTIC DIFFERENCES  
IN RESPONSE TO MUSIC

By  
ROBERT WILLIAM RESNICK

A DISSERTATION PRESENTED TO THE GRADUATE COUNCIL OF  
THE UNIVERSITY OF FLORIDA  
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE  
DEGREE OF DOCTOR OF PHILOSOPHY

UNIVERSITY OF FLORIDA  
December, 1967



UNIVERSITY OF FLORIDA



3 1262 08552 4006

"TO LIZ AND CHRISTI"

#### ACKNOWLEDGMENTS

The author would like to express appreciation to the members of the supervisory committee, Drs. Richard Anderson, Ben Barger, Hugh Davis, Ira Gordon, and C. M. Levy, for their encouragement and suggestions rendered during this study.

To Dr. Audrey Schumacher, Chairman, the author would like to express his special thanks for her time, effort, and wisdom which was both needed and appreciated.

The author would also like to thank Drs. H. T. Martin, Harry Grater, and Pincus Gross for their help and counsel throughout his graduate career.

Great appreciation is extended to Linda Harris, both for her typing of this manuscript and her sincere interest and help in preparing this study.

The author would also like to thank his mother, Sylvia Resnick, the pianist who recorded the stimulus materials for this study.

Finally, the author would like to thank his wife, Liz, who has given her help, her support, and her criticisms. Without Liz, this study could probably still be in process.

TABLE OF CONTENTS

	Page
ACKNOWLEDGMENTS . . . . .	iii
LIST OF TABLES . . . . .	v
CHAPTER	
I    INTRODUCTION . . . . .	1
II   STATEMENT OF THE PROBLEM . . . . .	14
III  HYPOTHESES . . . . .	18
IV   METHOD . . . . .	19
V    RESULTS . . . . .	26
VI   DISCUSSION . . . . .	41
VII  SUMMARY . . . . .	47
APPENDIX A . . . . .	50
APPENDIX B . . . . .	52
APPENDIX C . . . . .	54
BIBLIOGRAPHY . . . . .	56
BIOGRAPHICAL SKETCH . . . . .	59

LIST OF TABLES

Table		Page
1	Directional Predictions of Linguistic Scores on the Eight Linguistic Continua for the "Anxiety Neurotics" (High A, High R) and "Psychopaths" (Low A, Low R) Groups . . . . .	18
2	Means and Standard Deviations of the Raw Scores Made by Groups High, Middle, and Low to the Twelve Linguistic Variables . . . . .	27
3	One-way Analysis of Variance for Total Number of Words . . . . .	28
4	One-way Analysis of Variance for Number of Words per Sentence . . . . .	28
5	One-way Analysis of Variance for Per Cent Personal Pronouns . . . . .	29
6	One-way Analysis of Variance for Per Cent Personal Referents/Total . . . . .	29
7	One-way Analysis of Variance for Per Cent Personal Referents/Personal Pronouns . . . . .	29
8	One-way Analysis of Variance for Per Cent Qualifying Terms . . . . .	30
9	One-way Analysis of Variance for Per Cent Allness Terms . . . . .	30
10	One-way Analysis of Variance for Per Cent Negative Words . . . . .	30
11	One-way Analysis of Variance for Per Cent Adjectives . . . . .	31
12	One-way Analysis of Variance for Per Cent Verbs. . . . .	31

Table		Page
13	One-way Analysis of Variance for Verb/Adjective Quotient . . . . .	31
14	One-way Analysis of Variance for Type Token Ratio . . . . .	32
15	Mixed Factorial Analysis of Variance for Total Number of Words . . . . .	34
16	Mixed Factorial Analysis of Variance for Number of Words Per Sentence . . . . .	34
17	Mixed Factorial Analysis of Variance for Per Cent Personal Pronouns . . . . .	35
18	Mixed Factorial Analysis of Variance for Per Cent Personal Referents/Total . . . . .	35
19	Mixed Factorial Analysis of Variance for Per Cent Personal Referents/Personal Pronouns . . . . .	36
20	Mixed Factorial Analysis of Variance for Per Cent Qualifying Terms . . . . .	36
21	Mixed Factorial Analysis of Variance for Per Cent Allness Terms . . . . .	37
22	Mixed Factorial Analysis of Variance for Per Cent Negative Words . . . . .	37
23	Mixed Factorial Analysis of Variance for Per Cent Adjectives . . . . .	38
24	Mixed Factorial Analysis of Variance for Per Cent Verbs . . . . .	38
25	Mixed Factorial Analysis of Variance for Verb/ Adjective Quotient . . . . .	39
26	Mixed Factorial Analysis of Variance for Type Token Ratio . . . . .	39

## CHAPTER I

### INTRODUCTION

Relating linguistic behavior to personality has been termed psycholinguistics by Osgood and Seboek (1954) who defined it as being concerned with ". . . relations between messages and the characteristics of human individuals who select and interpret them." The present study attempts to investigate whether personality differences among subjects from an operationally defined normal population (i.e., male college students) can be identified by distinctive linguistic responses to musical stimuli. The focus of this study is on the relationship between personality and linguistic behavior although it is recognized that culture too is importantly related to personality and language.

#### Culture and language

Language has been recognized both as a means by which attitudes and modes of life are molded, as well as being molded by the individual's interactions with his environment. Edward Sapir, who is considered by many to be the father of modern linguistics, asserted that ". . . language does not exist apart from culture, that is, from the socially inherited assemblage of practices and beliefs that determine the texture of our lives" (Sapir, 1921; P. 221). A few years later Sapir wrote a

forceful synthesis of ideas describing the relationship between language and culture.

Language is a guide to "social reality." . . . Human beings do not live in the objective world alone, nor alone in the world of social activity ordinarily understood, but are very much at the mercy of the particular language which has become the medium of expression for their society. It is quite an illusion to imagine that one adjusts to reality essentially without the use of language and that language is merely an incidental means of solving specific problems of communication or reflection. The fact of the matter is that the "real world" is to a large extent unconsciously built up on the language habits of the group. . . . Even comparatively simple acts of perception are very much more at the mercy of the social patterns called words than we might suppose. . . . We see and hear and otherwise experience very largely as we do because the language habits of our community predispose certain choices of interpretation (Sapir, 1929; P. 209-210).

That the interaction works both ways seems also to be tenable in that although a hypothetical ideal structure of a language exists at any point in time, this structure is constantly in the process of changing due to the influence of the culture and probably the influence of individuals within that culture.

Benjamin L. Whorf, a former student of Sapir, has emphasized the hypothesis that cross-cultural linguistic differences systematically effect cross-cultural perceptual and cognitive ideational patterns. This concept has a long history dating to the latter part of the eighteenth century with Herder and Von Humboldt, and later with the philosopher Ernst Cassirer and the linguists Johann Leo Weisgerber and Jost Trier (Greenberg, 1961). Whorf rejected the concept of the natural logic of language which states that language is merely a formalized index system where parts and pieces are selected at will to build cognitions and

perceptions. Rather, it is the linguistic vessels available to the individual which determine the limits of his cognitive and perceptual fields (Whorf, 1956). Brown and Lenneberg summarize the Whorfian hypothesis by saying that ". . . language is not a cloak following the contours of thought. Languages are molds into which infant minds are poured" (Brown & Lenneberg, 1961; P. 481).

In testing the Whorfian hypothesis that linguistic habits determine how the world is viewed, Brown and Lenneberg (1961) had Harvard and Radcliffe undergraduates name colors which were projected on a screen. The stimuli (colors) were subdivided according to their wavelengths into those which were pure (primary) and those whose wavelengths were in between the standard colors, the latter being referred to as "colors-between-names." The length of the name given to each stimulus by the subject, his response latency, and the inter-subject reliability were measured. The "colors-between-names" had generally longer latencies, less inter-subject reliability, and longer names. The latter was significantly correlated with the latency and reliability measures both for inter- and intra-subject responses. Factor analysis revealed a single factor, codability, which the authors stated is highly related to cognitive and recognitional processes. Simply put: It is easier to package a cognition for which one has a linguistic container. Other studies (Carroll & Casagrande, 1958; Lorenz, 1953) also support the Whorfian hypothesis.

Gestalt field theory maintains that language incorporates unique ways of organizing the world. Their basic assumption is ". . . a conceptual intermediary world in each language which is not simply a

reflection of the external world but an ideational organization of this world, and which involves the speaker intimately and irrevocably in the culture of his group. This Zwischenwelt is the product of long years of cultural development" (Laffal, 1965; P. 112).

#### Language and personality

Nunnally suggests that ". . . individual differences in word usage relate importantly to individual differences in learning, perception, and personality" (Nunnally, 1965; P. 203). Nunnally goes on to assert that children learn words partly to solve problems. "The child learns to say 'water' because this will provide the required form of reinforcement more rapidly than will crying, random motions, or the use of any other word" (Nunnally, 1965; P. 205-206). The more appropriate responses (words) would therefore gain habit strength with inappropriate responses losing habit strength. It is important to note that the appropriateness of a response is based on the consequences contingent upon that response. Whether a child learns linguistic behavior in a classical or instrumental model, the behaviors become parts of his instrumental repertoire which differentially elicit responses from his environment.

With respect to the English language in particular, Alfred Korzybski (1951) asserted that our Aristotelian, subject-predicate thinking gives us a warped and rigid world outlook. He posited non-verbal thinking within a non-Aristotelian system as the answer which would loosen our linguistic shackles. (This position, in part, appears to be a specific application of the psychoanalytic "regression in the

service of the ego," where an individual returns to primary, non-verbal processes.) Korzybski's theory of General Semantics implicitly states that our linguistic system not only orders our perceptions but stultifies and stagnates them. It is the synthesis of some of the thinking of Sapir (1921, 1929), Whorf (1956), and more tangentially, Korzybski (1951) which has been the impetus for this present investigation.

Since linguistic patterns seem to be inexorably linked to perception and cognition, it would seem tenable to hypothesize that individual personality differences would lead to linguistic differences within a culture. Berg and Adams state that "the relationship between speech and personality has long been recognized" (1962; P. 66). They point out that most experimental attention has been addressed to the area of what (content) is said, rather than how (structure) it is said. Sanford (1949, as cited in Berg & Adams, 1962; P. 66) states that ". . . language traditionally, has been regarded as the 'vehicle of thought' with the thought attracting more attention than the vehicle." It would seem that structural characteristics of language are much less in the subject's awareness and hence are less subject to his volitional manipulations. Eisenson posited that "speech is most importantly used by man to make social adjustments, to elicit those responses from his environment which further his ends" (1938; P. 172). He stated that if it accepted that personality development consists essentially of the adjustments made by persons to their environment, and that if it is true that linguistic development is used most importantly to make social adjustments, then language and personality are inseparable (Eisenson, 1938).

One of the earliest experimental investigations of the structural characteristics of language as related to personality was carried out by Busemann in 1927 (as cited in Berg & Adams, 1962). He found that an increase in verbs as compared to the number of adjectives (verb/adjective quotient) was positively correlated with teachers' ratings of "emotional instability," while the percentage of adjectives correlated negatively with the same external criteria. Active (verb) responsiveness was therefore associated with instability while qualifying and individuating (adjective) responsiveness was associated with the reciprocal.

Balken and Masserman (1940) used the verb/adjective ratio to investigate the language of psychiatric patients in three diagnostic categories. The stimulus was a standard presentation of the T.A.T. cards, then called the Morgan-Murray cards. They then selected five obsessives-compulsives, five conversion hysterics, and five anxiety states, matching all for I.Q. The verb/adjective quotients obtained were 2.17, 1.35, and 3.11 for the compulsives, hysterics, and anxious patients, respectively. These three quotients are significantly different from each other, and in that respect at least, discriminate among diagnostic categories. Congruent with generally accepted psychological theory, the anxious subjects were dramatic and active, while the hysterics were less active and more descriptive.

Lorenz and Cobb (1953) compared the spontaneous speech accompanying responses to the T.A.T. for ten hysterical patients and ten control subjects. The hysterics used more verbs and pronouns, fewer adjectives (and therefore a higher verb/adjective quotient), conjunctions, prepositions, and articles. In another study by the same

investigators (Lorenz & Cobb, 1953), they reported the language habits of ten manic and ten control subjects. The manics, like the hysterics, used more pronouns, verbs, and fewer adjectives. Berg and Adams summarize the latter Lorenz and Cobb study as showing that ". . . the manic speech appeared to be relatively repetitive and homogeneous, unlike normal speech which qualifies and individualizes" (1953; P. 67).

Mann (1944) found a higher adjective/verb quotient for 30 undergraduate freshmen (.51) than for 30 schizophrenic hospitalized patients (.43). This ratio is the reciprocal of the one mentioned in the preceding studies and therefore is in agreement. That is, the verb/adjective quotient was again higher for the group with pathology.

The Type Token Ratio (TTR) as devised by Wendell Johnson (1944) compares the number of different words (the types) with the total number of words (the tokens). Mann (1944) has shown that normal subjects have a higher TTR than schizophrenic patients for spoken language. Fairbanks (1944) has shown the same thing for written language samples. She also found that the patients used personal pronouns for 10.4 per cent of their total words, compared to only 3.7 per cent for the freshmen. In addition, the patients used significantly more verbs, but fewer nouns, adjectives, conjunctions, prepositions, and articles. The patients used 1,087 negative words compared to only 484 for the freshmen, as well as doubling the freshmen frequency for the first person singular pronoun "I" (Fairbanks, 1944).

Osbood and Walker (1959) found significantly more "Allness" and "Qualifying" terms in suicide notes than in their controls (written letters). "Allness" terms are extreme and polarized statements or words

such as always and never. "Qualifying" terms are words which tend to modify and reduce the author's intensity of commitment, such as approximately and perhaps. Balken and Masserman (1940) found their hysterical group was highest on Allness terms and lowest on Qualifying terms, while the obsessive-compulsive group used the fewest Allness terms and the greatest number of Qualifying terms. Anxiety state patients were in the middle for both dimensions. The authors interpreted these results as supportive to the theory that hysterical patients characteristically are not vague or ambivalent in their adjustment, whatever else they may be. They saw the obsessive-compulsives' performance as indicative of the ambivalences and uncertainties manifest in their fantasies.

#### The stimulus situation and language

Perhaps inconsistencies of linguistic performance within and between studies would seem to be at least in part a function of the divergent stimuli employed. Brodsky (1964) empirically supported this hypothesis by showing significantly different linguistic scores for a self description and an impersonal description of a picture of a room. Other studies (Boder, 1940) have demonstrated that differences in linguistic performance are a function of the type of writing being done (e.g., legal documents versus novels).

In this current investigation, the particular nature of the auditory stimulus was such that the subject hopefully chose to be either "ego involved" or "objective." Music was chosen as the stimulus in this investigation for its emotional "pull" and meaningfulness which are, however, for the most part non-specific. Musical stimuli have the

unique attribute of being over-learned yet mostly non-specific. Musical stimuli are not so easily labelled as are visual stimuli. We have more verbal labels for describing visual phenomena, and since music is less related to linguistic labels, there is consequently less specific pull from such stimuli. It would follow that since musical experiences are not able to be named so easily as visual experiences, differences in description would be more a function of the subject's responding.

In terms of human ontogeny, response to sound is one of the first response modalities noted in the neonate. Indeed, there seems to be some evidence for even prenatal responses to auditory and tactile stimuli. Music, historically, has played a great role in the emotional lives of people. History points out that music is one of the forms that man has used to express his joy, his sorrow, his hope, and his love. "The powerful and immediate connection of musical experience, and the many indications that unconscious needs gain satisfaction through this medium, have long pointed to measures of musical preference as effective avenues to deeper aspects of personality" (Cattell & McMichael, 1960). This basis for selection of the specific music employed in this study will be discussed in the methodological section containing a description of the stimulus materials.

#### Personality characteristics and linguistic characteristics

With the empirical evidence regarding the relationship between language and personality reported above, the theoretical rationale for the personality groups employed in this current study will be explored.

Fenichel (1945) distinguishes between psychoneurotics and character disorders largely on the respective presence or absence of

anxiety and repressive mechanisms. Psychoneurosis is grounded in conflict, the impetus for anxiety, while character disorders are characterized by their lack of internal conflict and hence lack of anxiety and repression. Welsh (1956) empirically supported this hypothesis when he found via factor analysis that his 'A' scale (Anxiety) had its highest loading on scale 7 (psychasthenia) of the Minnesota Multiphasic Personality Inventory, while scale 4 (psychopathy) had no significant loading. In addition, while character disorders are seemingly immune to social pressures, psychoneurotics are continually brought into conflict by them. The psychoneurotics seem to be more "other directed," while the character disorders appear to be almost totally "inner directed." Theoretically, it would seem that personalities with high anxiety and need for social approval components would be qualitatively and quantitatively different from non-anxious, socially disdainful personalities, in terms of linguistic habits.

It is evident that people sometimes differ as to their linguistic habits both cross-culturally and according to psychological diagnoses. Clearly this is to a considerable extent environmental, cross-culturally. All members of a culture are exposed to approximately the same language system. Within a culture, however, individual members may differ in their "selection" of linguistic habits. To say that a culture's language habits are homogeneous is not to say that there are no individual differences. Just as different languages have some commonalities, yet retain very real differences, individuals or groups within a single linguistic system may also retain some differences.

More specifically, if psychoneurotics (e.g., High A, High R on the MMPI) have found by selective learning that certain linguistic habits are more efficient (reinforcing) in terms of satisfying their systems of needs, defenses, anxieties, and satisfactions, then their linguistic characteristics may so demonstrate. While language habits may be commonly available to all members of a linguistic group, it does not follow that all members of that group will embrace all of the habits. Explicitly, members of a linguistic culture are exposed to approximately the same linguistic habits. However, individuals respond to the same constellation of linguistic stimuli in terms of their idiosyncratic system of needs, defenses, and anxieties in order to maximize adaptation. Therefore, it might be expected that people with similar needs, defenses, and anxieties (personalities) are more like other individuals with similar need systems than they are to individuals with divergent systems. In experimental terms, the variance between personality groups would be expected to significantly exceed the variance within personality groups. People who share personality patterns may also share linguistic habits due not necessarily to sharing needs at that time, but due to the relative homogeneity of their past and present environments.

#### Anxiety and repressor scales

Welsh (1956) reports that dozens of factor analytic studies essentially agreed as to the loadings of the first two factors on the Minnesota Multiphasic Personality Inventory although the interpretations and the names assigned to these factors vary. The first factor shows very high loadings on scale 7 (Pt) and scale 8 (Sc) with negative

loadings on K whenever it is used. The second factor shows fairly high loadings on the neurotic triad (scales 1, 2, and 3), especially scale 3 (Hy) and scale 2 (D), with negative loadings frequently appearing on scale 9 (Ma). It is important to note that the ". . . similarity of loadings on these two factors has appeared despite the varying populations employed" (Welsh, 1956; p. 264). Welsh calls these first two factor scales on the MMPI Anxiety (A) and Repressor (R). The A and R dimensions were employed to select subjects for the current study due to their high reliability and their more total representation of variance on the MMPI than almost any combination of clinical scales. The disadvantage of using factor analytically derived scales lies in the uncertainty of what dimensions this neat cluster of loadings represents. Pragmatically, the factor becomes really useful after it has been isolated and then studied both retrospectively and longitudinally.

Dahlstrom and Welsh (1960) and Hathaway and Meehl (1951, as cited in Dahlstrom & Welsh, 1960) describe High A, High R's on the MMPI as anxious, depressed, tense, nervous, and obsessive-compulsive. Guthrie (as cited in Dahlstrom & Welsh, 1960), in studying medical patients with the above symptoms, found 40 items on the MMPI which were characteristic of this group. Almost all of the 40 items are from clinical scales 2 and 7, particularly the items on those scales which also appear on Welsh's A scale. Welsh (1956) describes people with elevated A and R scores as usually diagnosed as anxiety states, manic-depressive, depressed, or reactive-depressive.

Welsh (1956) describes people with low A and R scores as usually diagnosed as behavior and/or character disorders, alcoholics, or

manic-depressive, manic. Hathaway and Meehl (1951, as cited in Dahlstrom & Welsh, 1960) state that most psychiatric patients with this pattern are diagnosed as psychotic with manic disorders predominating. Although a significant subgroup were categorized as conduct disorders, neurotic disorders were almost non-existent. It is important to note that Hathaway and Meehl are describing a psychiatric population and not a college population.

## CHAPTER II

### STATEMENT OF THE PROBLEM

Linguistic differences have been shown by cross-cultural studies to be related to cultural differences in cognitions and perceptions and, inferentially, to attitudes (Brown & Lenneberg, 1961; Whorf, 1956; Carroll & Casagrande, 1958). While a common language tends to make for common attitudes, differences in attitudes might be expected to make for language differences within a common language.

Certain language differences have been related to psychological diagnoses (Busemann, 1927; Balkan & Masserman, 1940; Chotlos, 1944; Fairbanks, 1944; Mann, 1944; Lorenz & Cobb, 1953, 1953, 1954). The current research used subjects selected from the normal population according to personality characteristics as measured by the A and R scales on the MMPI. Age, sex, and educational history of the Ss were held constant across conditions. Musical themes were selected as the stimuli, since as previously noted, it was expected that music would lend more freedom from specific verbal labels due to music's being mostly over-learned yet non-specific. Structural linguistic scores were selected for the dependent variables due to their previous fruitful use, high reliability, and the fact that subjects are largely unaware of the structure of their language and therefore less able to volitionally manipulate it.

Linguistic dimensions

The linguistic dimensions employed in this investigation were:

1. Total Number of Words
2. Number of Words Per Sentence
3. Per Cent Personal Pronouns
4. Per Cent Qualifying Terms
5. Per Cent Allness Terms
6. Per Cent Negative Words
7. VAQ (verb/adjective quotient)
8. TTR (type token ratio)

The criteria and procedure for judging, coding, and tabulating these dimensions are described in the Methods section of this paper.

For the purposes of this investigation, the term "anxiety neurotic" will be synonomous with the High A, High R factors on the MMPI, while the term "psychopath" will be synonomous with the Low A, Low R pattern on the MMPI. Anxiety neurotics and psychopaths are therefore operationally defined by their A and R scores on the MMPI. Persons who differed on these two personality dimensions were compared on a number of linguistic dimensions with the prediction being made that they differ significantly along these dimensions. Each of the linguistic dimensions will be discussed in turn, in terms of the theory underlying the particular directional prediction. The predictions are as follows:

Total Number of Words.--Since psychopathic personalities are described as those finding it difficult to expend large amounts of effort in tasks imposed upon them by others, it is predicted that they

will score lower on this dimension than the anxiety neurotics who will probably feel obliged to do as much as they have time for, once they get started.

Number of Words Per Sentence.--Although it is predicted that psychopathic personalities will use a lower total number of words, it is felt that they will use more words per sentence. In addition to the anxiety neurotic's need for closure and need to restrict external stimulation, the psychopath may not write many sentences for the experimenter but will probably write longer individual sentences since this IS a task he has decided to accept. Once he has decided to accept a single sentence as a personal task, it is felt that he will perform that task as if it were self-imposed.

Personal Pronouns.--Since the psychopathic personality is seen as being more "inner directed" and would seem to mold his perceptions egocentrically, and since the anxiety neurotic appears to be more "other directed" and less egocentric at least when dealing with the outside world, it is predicted that psychopathic personalities will use more personal pronouns than anxiety neurotics.

Qualifying Terms.--Since this dimension may be viewed as a function of the VAQ, it is predicted that anxiety neurotics will score higher on this dimension than will psychopathic personalities. Qualifying terms restrict commitment, and would therefore seem to be appropriate tools for the anxiety neurotic.

Allness Terms.--The prediction for this dimension is that anxiety neurotics will score lower than psychopaths. Since allness terms are

described as an index of commitment, it would seem that the cautious predilection of the anxiety neurotic would negate a high percentage of allness terms. The psychopathic personality, on the other hand, views his world in more black and white terms, and therefore is expected to score higher on this dimension.

Negative Words.--For this linguistic dimension, it is predicted that anxiety neurotics will score higher than psychopaths. The former sees his world as having faults and therefore to be negated. Psychopaths, on the other hand, seem to be more active upon their world than reactive to it.

Verb/Adjective Quotient.--The prediction for this linguistic dimension is that anxiety neurotics will have a lower VAQ than will psychopathic personalities. As with qualifying terms, anxiety neurotics are concerned with modifying their actions so as to offend as few as possible.

Type Token Ratio.--Psychopathic personalities are predicted to be higher on this dimension than anxiety neurotics since the anxiety component of the latter would tend to induce perseveration and restrictiveness. Since the TTR is the number of different words per unit of words, then the relatively "uninhibited" psychopath would tend to score higher.

## CHAPTER III

### HYPOTHESES

#### Primary hypothesis

The general hypothesis proposed is: Persons in a normal population with anxiety neurotic and psychopathic personality patterns as measured by the A and R scales on the MMPI can be differentiated by psycholinguistic analyses of responses to musical stimuli.

#### Secondary hypotheses

More specifically, the following direction of differences on the eight linguistic continua previously discussed are summarized in Table 1.

Table 1

Directional Predictions of Linguistic Scores on the Eight Linguistic Continua for the "Anxiety Neurotics" (High A, High R) and "Psychopaths" (Low A, Low R) Groups

Linguistic Variables	Groups	
	"Anxiety Neurotics" High A, High R	"Psychopaths" Low A, Low R
1. Total Number of Words	High	Low
2. Number of Words/Sentence	Low	High
3. Personal Pronouns	Low	High
4. Qualifying Terms	High	Low
5. Allness Terms	Low	High
6. Negative Words	High	Low
7. Verb/Adjective Quotient	Low	High
8. Type Token Ratio	Low	High

## CHAPTER IV

### METHOD

#### Subjects

The subjects for this investigation were 50 male students in the University College of the University of Florida. When they entered the University, all incoming freshmen were routinely given the Minnesota Multiphasic Personality Inventory. The three groups were selected according to their Anxiety (A) and Repressor (R) scores on the MMPI. A and R are the first two factors of the MMPI and together account for most of the variance on that instrument (Welsh, 1956). The High, Middle, and Low scoring groups consisted of 20, 12, and 18 Ss, respectively.

The High A and R ("anxiety neurotics") group consisted of Ss whose A score on the MMPI was at least one standard deviation above the population mean of A and whose R score was above the population mean of R. The mean A and R scores for this experimental group were 64.9 and 53.6, respectively, with standard deviations of 4.2 and 4.3. The population means for A and R are both 50.

The Middle A and R ("normals") group consisted of Ss whose A and R scores were both at (or near) the A and R means. The mean A and R scores for this group were 49.9 and 49.9, respectively, with standard deviations of 1.2 and 2.1. This group was included in order to provide base line data.

The Low A and R ("psychopathic characteristics") group consisted of Ss whose R score on the MMPI was at least one standard deviation below the mean of R and whose A score was below the mean of A. The mean A and R scores for this experimental group were 42.5 and 36.6, respectively, with standard deviations of 5.4 and 3.4.

Freshmen at the University of Florida are relatively homogeneous in age, educational background, and socio-economic status, and the three groups were considered to be matched on these variables. Occasional differences were assumed to occur randomly among the three groups.

#### Stimulus materials

The stimulus constellation consisted of two presentations of seven discrete musical themes played on a piano and recorded on audio tape. The seven themes were recorded with an inter-stimulus interval of ten seconds. The themes were adaptations of those which accompanied silent movies. This music was chosen for the following reasons based on pilot work done by this writer in 1962:

1. Each theme in the set seemed to express an exaggerated emotion.
2. The themes were arranged so as to follow a sequence which lends itself to either a continuous story or several discrete stories.
3. The same music was used for many different plots, since it attempted to capture a feeling tone rather than an event.
4. Subjects found it relatively easy to respond to these stimuli.
5. As a free response stimulus, movie music appeared "safe" to Ss since many of them did not feel they were putting themselves into the stories--they were just re-telling the "traditional old time movie story" (if they recognized that the stimuli were movie music).

The seven musical themes generally follow the basic sequence employed in most silent movies. They are, as specifically as possible, as follows:

1. Opening them. Non-specific, ethereal. "Sets the stage" for any action to follow.
2. Statement of female (usually heroine). Adaptation of "Sweetheart of Old Sigma Chi."
3. Statement of male (usually hero). Adaptation of "My Hero."
4. Statement of conflict (usually villain or situational).
5. Statement of action (usually chase and/or flight) terminating in resolution of conflict.
6. Reunion of hero and heroine, no inference as to future. Adaptation of "Kiss Me Again."
7. Statement of future (positive or negative). Adaptation of "Hearts and Flowers."

#### Procedure

The Ss were invited by letter to participate in an experiment in the "Psychology of Music." A copy of the letter sent can be found in Appendix A. They were asked to report to the Language Laboratory at the University of Florida. This laboratory contains 154 individual cubicles equipped with earphones to monitor any of three channels transmitted from a small room in the rear, housing tape playback equipment. Each S was given a booklet containing a mimeographed identification cover sheet and ten pieces of lined loose-leaf type paper. After checking earphones, tape equipment, etc., all S were read the following instructions by the writer, who stood at the front of the room:

You are going to hear a group of musical pieces played twice. The first time you hear them I want you just to listen. Do not write anything until you are told. The second time you will hear the musical pieces in exactly the same order and you will have time between each piece to write a story that the music suggests to you.\* I will tell you when the music is about to be played for the second time. You may write one story or several short stories. Remember, the first time you just listen to the music, and the second time write a story based on what the music suggests to you. Any story will be fine. Please do not remove your earphones or talk to anybody else. If you have any questions, please raise your hand now.

At the end of the session, all Ss were asked to indicate, without conferring with anyone, what kind of music they had heard. The purpose of this was to determine whether recognition of the stimulus materials as old time movie music varied among the three groups. In addition, Ss were asked to indicate whether they were "tone deaf" or had any hearing problems of which they were aware. After the booklets were collected, interested Ss were asked to remain to hear an explanation of the experiment.

#### Tabulation of dependent variables

A total of about 25,000 responses (words) were elicited from the Ss of this investigation. Each of these responses were judged, coded, and tabulated twelve times, once for each of the linguistic dimensions which were the dependent variables in the analyses. The procedure for judging, coding, and tabulating is outlined below.

Total Number of Words.--Each group of letters separated by spaces on both sides from adjacent groups of letters was counted as

---

\*The time allowed for writing after each musical theme was four minutes.

a word, even though it might be part of a place name, as in Des Moines (two words), an initial, as in James A. Brown (three words), or a neologism coined by the subject. Any number was counted as one word; for example, 125 was tabulated as one word. A hyphenated word was counted as one word. Each time a word was used it was counted as an additional word. Contractions were treated as one word; for example, can't was tabulated as a single word. Abbreviations were also treated as one word such as M.D.

Number of Words per Sentence.--Sentences were defined by their punctuation, whether or not they were grammatically correct. The Total Number of Words was divided by the Total Number of Sentences to yield the Number of Words per Sentence.

Per Cent of Personal Pronouns.--Personal Pronouns were operationally defined to be: I, me, my, myself, we, our, us, you, you, she, he, her, his, hers, him, your, they, their, them, herself, himself, themselves, youself, and ourselves. The Personal Pronouns were color coded, summed, then divided by that S's Total Number of Words, and multiplied by 100 to yield the Per Cent of Personal Pronouns.

Per Cent of Personal Referents.--Personal Referents were operationally defined to be: I, my, me, myself, we, us, and our. The Personal Referents were color coded, summed, then divided by that S's Total Number of Words or Total Number of Personal Pronouns, and multiplied by 100 to yield Per Cent of Personal Referents/Total and Per Cent of Personal Referents/Personal Pronouns.

Qualifying Terms.--Qualifying Terms were operationally defined to be: almost, approximately, about, apparently, more-or-less, maybe,

especially, perhaps, somewhat, evidently, sometimes, could, probably, possibly, except, around, may, at times, generally, slight, and appears. The Qualifying Terms were color coded, summed, divided by that S's Total Number of Words, and multiplied by 100 to yield the Per Cent of Qualifying Terms.

Allness Terms.--Allness Terms were operationally defined to be: all, never, completely, always, anything, nothing, entirely, nobody, everybody, forever, utter, exactly, undoubtedly, anybody, wholly, every, absolutely, everyone, no-one, no doubt, eternity, and ultimately. The Allness Terms were color coded, summed, then divided by that S's Total Number of Words and multiplied by 100 to yield the Per Cent of Allness Terms.

Negative Terms.--Negative Terms were operationally defined to be: no, not, never, none, neither, nothing, nobody, nowhere, and unable. The Negative Terms were color coded, summed, then divided by that S's Total Number of Words, and multiplied by 100 to yield the Per Cent of Negative Terms.

Adjectives.--Adjectives were defined by regular classification, and any verb form (i.e., participle) which the dictionary recognizes as an adjective (Webster's Collegiate). The Adjectives were color coded, summed, then divided by that S's Total Number of Words, and multiplied by 100 to yield the Per Cent of Adjectives.

Verbs.--Verbs were defined as all simple verbs, participles plus auxiliaries, gerunds and participles unless the dictionary recognizes them as nouns and adjectives, as the case may be (Webster's Collegiate). The verbs were color coded, summed, and then divided by that S's Total Number of Words, and multiplied by 100 to yield the Per Cent of Verbs.

Verb/Adjective Quotient.--The VAQ was derived by dividing that S's total number of Verbs by his total number of Adjectives.

Type Token Ratio.--The TTR was defined as the number of different words per 100 words. These 100 word samples were then averaged to yield a mean segmental TTR.

## CHAPTER V

### RESULTS

Four additional linguistic variables were culled from the data since one of the measures (Per Cent of Personal Pronouns) was judged to be too global in nature, hiding, rather than revealing relevant data. Specifically, two additional variables dealing with personal pronouns were added, namely, Per Cent of Personal Referents which was then computed both as a percentage of the total number of words as well as a percentage of all personal pronouns. The VAQ dimension was also studied further by adding Per Cent of Verbs and Per Cent of Adjectives to the variables. Thus, the total number of linguistic variables in this study was twelve.

Table 2 shows the means and standard deviations of the raw scores of the High, Middle, and Low groups on the A and R scales for all twelve linguistic variables. As can be seen from Table 2, the standard deviations for these linguistic continua are quite large, in some cases exceeding their means (e.g., Per Cent Personal Referents/Personal Pronouns). These large standard deviations indicate considerable overlap among the three distributions on any particular linguistic variable.

Table 2

Means and Standard Deviations of the Raw Scores Made by Groups High, Middle, and Low A and R to the Twelve Linguistic Variables

Linguistic Variable	Mean	S.D.	Group		
			High	Middle	Low
Total Words	441.50	159.53	474.00	137.65	455.17
Words/Sentence	16.00	3.72	16.86	6.42	16.97
% Personal Pronouns	7.85	2.94	7.42	2.69	8.89
% Personal Ref./Total	.95	1.88	.92	2.02	2.33
% Personal Ref./P.P.	15.90	27.29	15.25	24.26	28.06
% Qualifying Terms	.45	.58	.25	.43	.39
% Allness Terms	1.00	1.04	.92	.76	1.06
% Negative Words	1.10	.94	1.08	.76	1.17
% Adjectives	22.84	5.65	23.47	4.61	21.54
% Verbs	20.25	3.66	20.88	2.99	20.99
VAQ	.99	.49	.95	.32	1.04
TTR	71.25	5.49	68.50	3.93	69.22
					3.55

Tables 3 through 14 represent the one-way analyses of variance for each of the twelve linguistic variables among the High, Middle, and Low A and R groups. These analyses compared each group's mean on a variable to the grand mean for that variable across all three groups.

Table 3

One-way Analysis of Variance for  
Total Number of Words

Source	d.f.	Mean Square	<u>F</u> *
Between	2	3973.53	.143
Within	47	27704.34	
Total	49		

$$*F .05 (2,47) = 3.53$$

Table 4

One-way Analysis of Variance for  
Number of Words per Sentence

Source	d.f.	Mean Square	<u>F</u>
Between	2	5.23	.205
Within	47	25.54	
Total	49		

Table 5

One-way Analysis of Variance for  
Per Cent Personal Pronouns

Source	d.f.	Mean Square	<u>F</u>
Between	2	9.02	.081
Within	47	11.26	
Total	49		

Table 6

One-way Analysis of Variance for  
Per Cent Personal Referents/Total

Source	d.f.	Mean Square	<u>F</u>
Between	2	11.23	2.24
Within	47	5.02	
Total	49		

Table 7

One-way Analysis of Variance for  
Per Cent Personal Referents/Personal Pronouns

Source	d.f.	Mean Square	<u>F</u>
Between	2	887.14	1.07
Within	47	824.25	
Total	49		

Table 8

One-way Analysis of Variance for  
Per Cent Qualifying Terms

Source	d.f.	Mean Square	<u>F</u>
Between	2	.151	459
Within	47	.329	
Total	49		

Table 9

One-way Analysis of Variance for  
Per Cent Allness Terms

Source	d.f.	Mean Square	<u>F</u>
Between	2	.069	.082
Within	47	.848	
Total	49		

Table 10

One-way Analysis of Variance for  
Per Cent Negative Words

Source	d.f.	Mean Square	<u>F</u>
Between	2	.032	.030
Within	47	1.047	
Total	49		

Table 11

One-way Analysis of Variance for  
Per Cent Adjectives

Source	d.f.	Mean Square	F
Between	2	14.99	.553
Within	47	27.11	
Total	49		

Table 12

One-way Analysis of Variance for  
Per Cent Verbs

Source	d.f.	Mean Square	F
Between	2	2.93	.245
Within	47	11.95	
Total	49		

Table 13

One-way Analysis of Variance for  
Verb/Adjective Quotient

Source	d.f.	Mean Square	F
Between	2	.034	.191
Within	47	.179	
Total	49		

Table 14

One-way Analysis of Variance for  
Type Token Ratio

Source	d.f.	Mean Square	<u>F</u>
Between	2	5.48	.538
Within	47	10.20	
Total	49		

None of the Fs in Tables 3 through 14 indicates statistical significance, suggesting that the variance among the three groups is no greater than one would expect from chance fluctuations. Thus, any group's mean on any linguistic variable does not differ significantly from the grand mean for that linguistic variable. Finally, since none of the Fs were significant, we assume that all observed differences among the three groups are attributable to chance alone (Lindquist, 1953). It is noteworthy, however, that the two variables related to Per Cent of Personal Referents came closest to discriminating among the groups. This may be related to previous research which indicated that psychiatric patients used double the number of the pronoun 'I' than did college students (Fairbanks, 1944). However, since the differences in the findings did not depart from chance, these comments are only raised very speculatively.

It is significant to note that none of the Ss in this investigation indicated any hearing difficulties of which they were aware. Furthermore, recognition of the stimulus materials as old time movie music occurred in 30, 25, and 22 per cent of the High, Middle, and Low A and R groups. These differences revealed a non-significant chi-square.

Thus, there appeared to be no differential recognition of the themes by the three groups.

#### Additional analyses

The statistical analyses employed thus far were based on each S's total scores on each of the twelve linguistic dimensions. That is, although the Ss responded to seven discrete musical themes, their score for any single linguistic variable were summed for all seven stimuli. The question was raised as to whether the High, Middle, and Low groups produced significantly different scores on a single or several musical themes on any of the twelve variables. The approximately 25,000 responses were retabulated and recomputed for each subject on each variable separately within each of the seven themes, yielding 84 scores per S. These data were then analyzed for each of the twelve variables separately, using a mixed factorial design with two factors, one of which has repeated measures (Lindquist, 1953). This design tests the interaction between musical themes and groups for each of the linguistic continua. Tables 15 through 26 presents the analyses of variance for each of the twelve linguistic variables.

Table 15

Mixed Factorial Analysis of Variance for  
Total Number of Words

Source	d.f.	Mean Square	<u>F</u>
Groups (G)	2	611.18	0.154
Error Between	47	3957.33	10.654
Themes (T)	6	714.79	1.924
G by T	12	521.22	1.403
Error Within	282	371.45	
Total	349		

$$\begin{aligned} *F .05 (2, 47) &= 3.23 \\ **F .05 (6, 282) &= 2.10 \\ ***F .05 (12, 282) &= 1.80 \end{aligned}$$

Table 16

Mixed Factorial Analysis of Variance for  
Number of Words Per Sentence

Source	d.f.	Mean Square	<u>F</u>
Groups	2	7623.69	0.365
Error Between	47	20873.26	4.883
Themes	6	8702.42	2.036
G by T	12	1913.51	0.448
Error Within	282	4275.02	
Total	349		

$$\begin{aligned} *F .05 (2, 47) &= 3.23 \\ **F .05 (6, 282) &= 2.10 \\ ***F .05 (12, 282) &= 1.80 \end{aligned}$$

Table 17

Mixed Factorial Analysis of Variance for  
Per Cent Personal Pronouns

Source	d.f.	Mean Square	F
Groups	2	106.01	1.357
Error Between	47	78.13	4.324
Themes	6	64.36	3.562**
G by T	12	12.87	0.712
Error Within	282	18.07	
Total	349		

\* $F$  .05 (2, 47) = 3.23  
\*\* $F$  .05 (6, 282) = 2.10  
\*\*\* $F$  .05 (12, 282) = 1.80

Table 18

Mixed Factorial Analysis of Variance for  
Per Cent Personal Referents/Total

Source	d.f.	Mean Square	F
Groups	2	80.84	2.425
Error Between	47	33.34	6.746
Themes	6	7.41	1.499
G by T	12	2.06	.418
Error Within	282	4.94	
Total	349		

\* $F$  .05 (2, 47) = 3.23  
\*\* $F$  .05 (6, 282) = 2.10  
\*\*\* $F$  .05 (12, 282) = 1.80

Table 19

Mixed Factorial Analysis of Variance for  
Per Cent Personal Referents/Personal Pronouns

Source	d.f.	Mean Square	<u>F</u>
Groups	2	6275.62	1.409
Error Between	47	4453.59	8.456
Themes	6	517.29	0.982
G by T	12	444.81	0.845
Error Within	282	526.69	
Total	349		

\*F .05 (2, 47) = 3.23  
\*\*F .05 (6, 282) = 2.10  
\*\*\*F .05 (12, 282) = 1.80

Table 20

Mixed Factorial Analysis of Variance for  
Per Cent Qualifying Terms

Source	d.f.	Mean Square	<u>F</u>
Groups	2	0.98	0.802
Error Between	47	1.22	1.315
Themes	6	0.57	0.612
G by T	12	0.68	0.734
Error Within	282	0.92	
Total	349		

\*F .05 (2, 47) = 3.23  
\*\*F .05 (6, 282) = 2.10  
\*\*\*F .05 (12, 282) = 1.80

Table 21

Mixed Factorial Analysis of Variance for  
Per Cent Allness Terms

Source	d.f.	Mean Square	F
Groups	2	1.44	0.339
Error Between	47	4.25	1.553
Themes	6	3.74	1.367
G by T	12	3.31	1.211
Error Within	282		
Total	349		

 $^*F .05 (2, 47) = 3.23$  $^{**}F .05 (6, 282) = 2.10$  $^{***}F .05 (12, 282) = 1.80$ 

Table 22

Mixed Factorial Analysis of Variance for  
Per Cent Negative Words

Source	d.f.	Mean Square	F
Groups	2	2.75	0.337
Error Between	47	8.15	2.062
Themes	6	1.70	0.431
G by T	12	1.63	0.411
Error Within	282	3.95	
Total	349		

 $^*F .05 (2, 47) = 3.23$  $^{**}F .05 (6, 282) = 2.10$  $^{***}F .05 (12, 282) = 1.80$

Table 23

Mixed Factorial Analysis of Variance for  
Per Cent Adjectives

Source	d.f.	Mean Square	<u>F</u>
Groups	2	31.86	0.179
Error Between	47	177.64	4.656
Themes	6	92.46	2.423**
G by T	12	42.69	1.119
Error Within	282	38.15	
Total	349		

$^*F .05 (2, 47) = 3.23$   
 $^{**}F .05 (6, 282) = 2.10$   
 $^{***}F .05 (12, 282) = 1.80$

Table 24

Mixed Factorial Analysis of Variance for  
Per Cent Verbs

Source	d.f.	Mean Square	<u>F</u>
Groups	2	6.89	0.071
Error Between	47	96.65	3.893
Themes	6	57.84	2.330**
G by T	12	25.89	1.043
Error Within	282	24.83	
Total	349		

$^*F .05 (2, 47) = 3.23$   
 $^{**}F .05 (6, 282) = 2.10$   
 $^{***}F .05 (12, 282) = 1.80$

Table 25

Mixed Factorial Analysis of Variance for  
Verb/Adjective Quotient

Source	d.f.	Mean Square	<u>F</u>
Groups	2	16554.50	.711
Error Between	47	23288.93	3.069
Themes	6	15930.50	2.099
G by T	12	4191.08	0.552
Error Within	282	7589.27	
Total	349		

 $^*F .05 (2, 47) = 3.23$  $^{**}F .05 (6, 282) = 2.10$  $^{***}F .05 (12, 282) = 1.80$ 

Table 26

Mixed Factorial Analysis of Variance for  
Type Token Ratio

Source	d.f.	Mean Square	<u>F</u>
Groups	2	357.68	1.162
Error Between	47	307.68	4.320
Themes	6	64.44	0.905
G by T	12	72.94	1.024
Error Within	282	71.22	
Total	349		

 $^*F .05 (2, 47) = 3.23$  $^{**}F .05 (6, 282) = 2.10$  $^{***}F .05 (12, 282) = 1.80$

Tables 15 through 26 show that none of the interactions between Groups and Themes are significantly different from chance, indicating that the High, Middle, and Low A and R groups did not differ significantly on any of the twelve variables within any of the seven stimuli.

Three variables, Per Cent Personal Pronouns, Per Cent Adjectives, and Per Cent Verbs, did yield significant Fs at the .05 level for Themes (See Appendix C). This suggests that the three groups combined differed in their linguistic behavior across themes on those variables. However, the three groups did not differ from each other in their linguistic behavior across themes as indicated by their interactions which did not depart significantly from chance on any of the twelve linguistic variables. It should be noted that the three significant Fs found for Themes constitute only eight per cent of the 36 Fs computed and therefore their significance may be due to chance factors. That possibility is reduced, however, since all three significant Fs appeared on the same factor (Themes).

## CHAPTER VI

### DISCUSSION

The results of this investigation as presented in the previous chapter fail to reject the primary null hypothesis that linguistic differences among the High, Middle, and Low A and R groups do not differ significantly from chance. It therefore follows that the various secondary null hypotheses are also not rejected, that is, none of the directional differences predicted depart significantly from chance. Since the latter hypotheses are secondary both in the ordinal and connotative sense, it would be superfluous to comment about specific directional predictions when the primary hypothesis predicting differences in any direction was not supported.

The results of this study suggest that male college groups with the magnitude of discrepancy on the A and R scales of the MMPI such as these do not show significantly different responses to old time movie music on selected, formal, structural linguistic characteristics. The negative findings of this investigation suggest the possibility of an inherent deficit in the stimulus materials, population sampled, linguistic variables or some combination of these three entities. Since these language variables have been previously demonstrated to discriminate significantly among groups (Balkan & Masserman, 1940; Fairbanks, 1944; Mann, 1944; Lorenz & Cobb, 1953; Osgood & Walker, 1959), it seems reasonable to assume that their lack of discriminative power in this study may be a function of some other variable or variables.

The stimulus materials employed in this study, old time movie music, may in part be related to the non-significant results of this investigation. Brodsky (1964), has demonstrated that linguistic scores are significantly effected by the particular stimuli employed. Boder (1940), has also shown that linguistic scores differ depending on the explicit purposes of the particular linguistic performance (e.g., novels versus scientific writings versus legal documents). To the best of this writer's knowledge there are no empirical studies published dealing with linguistic scores as a function of music, although auditory projective tests have been developed by Skinner (1936), and Stone (1953). Perhaps old time movie music, being a very specific example of the class of auditory stimuli, may elicit structural linguistic scores which are very different from visual stimuli such as T.A.T. cards. Specifically, the frequency and range of exposure to old time movie music is somewhat restricted and possibly stereotypic. The differential exposure of old time movie music may result in shared and learned modal responses across many sub-populations of the culture. It may be that language describing old time movie music is as homogeneous as, for example, biblical language or the linguistic idiom of jazz. Even though young adults may never have seen a silent movie with piano accompaniment, possibly many of them have heard this type of music satirically accompanying television skits and/or movie vignettes. Although frequency of exposure to old time movie music probably varies, the sources of such music are quite restricted, particularly since they have in some ways become part of our present-day cultural mythology. Thus, old time movie

music may be too "labelled" and stereotypic to elicit differential linguistic responses. The fact that on three variables, Per Cent Personal Pronouns, Per Cent Adjectives, and Per Cent Verbs, the High, Middle, and Low A and R groups did differ in their linguistic behavior across themes although not among groups further supports the hypothesis that old time movie music may be more stereotypic and have more labels than was originally expected. This may not be, however, representative of all music. Other types of music may prove extremely useful in the future as stimuli in personality research, just as various types of visual stimuli are differentially useful.

The second variable which may have heavily influenced the results of this investigation is the location of the populations sampled on the normal/deviant continuum. The samples employed in this study were roughly equivalent to a trichotomous division of the normal range in many other studies. For example, Mann (1944), found significant linguistic differences between college freshmen and hospitalized schizophrenic patients. This present study attempted to discriminate among personality types with a population similar to the freshman half of Mann's Ss. Clearly the total range of pathology for all of Mann's Ss is far larger than the range for Ss in this current study. In other words, the range of Ss sampled for this study spanned only one-half of that involved in former studies. Perhaps samples drawn from the operationally defined normal population (e.g., students) may not demonstrate behavioral differences which have been demonstrated when these samples were combined and then compared to deviant populations (e.g., hospitalized schizophrenics) as Mann did in her study.

A third variable which may have influenced the results of the present investigation is the relative cultural homogeneity of the populations sampled. Specifically, twenty-year-old college students may share many more mores, habits, attitudes, and interests with each other than they probably do with other twenty-year-old males who did not go to college. Speculatively, college males and other males may have been differentially reinforced for their linguistic behavior and therefore at any point in time would probably respond differentially to stimuli eliciting a linguistic response. The linguistic homogeneity of various young peoples' sub-cultures (peer groups) within the entire population may be seen as a rough indication of their values, mores, and attitudes. For example, the language of an urban street gang member is generally expected to differ from a college student.

Behavioral responses, in this case linguistic performance, are determined by situational, peer reference, and cultural factors as well as personality factors. The Ss in this investigation were selected to be alike in sex, age, culture, and educational level in order to minimize the possible variance from these sources, thereby attributing any variance which did occur in excess of chance to their personality differences. It may be, however, that controlling such factors as sex, age, culture, and educational level resulted in a group of subjects who may be a good deal alike on many personality characteristics aside from A and R. Thus, the homogeneity of responses (linguistic behavior) of the college students in this investigation may be but a single expression of their more total sub-culture homogeneity.

Thus far, the three hypothesized problem areas in this investigation have included the properties of the stimulus materials, the limited range sampled on the normal/deviant continuum, and the relative cultural homogeneity of the populations sampled. While these three possibilities surely do not exhaust the possible explanations of negative results, they do seem to this writer to represent the most basic, first order problems.

The relationships among culture, personality, and linguistics are clearly complex. The results of this current study suggest that within the normal population, culture may be a more potent determinant of structural linguistic behavior than personality. This seems tenable since the three groups in this study did not differ from each other across themes on any of the twelve linguistic variables, yet collectively differed across themes on three of the variables. By contrast, some studies using hospitalized psychiatric patients have previously demonstrated substantially different linguistic behavior than normals. However, it is again difficult to know if the source of their linguistic differences is due to personality and/or cultural factors. In a very real sense, hospitalized psychiatric patients are as culturally deviant as they are "emotionally" deviant. Operationally, people are hospitalized when they cannot be efficiently maintained in their culture. Speculatively, it is suggested that the more culturally deviant a person is, the more his language may be determined by his personal needs rather than the cultural and/or situational factors present.

Since the linguistic variables have previously demonstrated their ability to discriminate between clearly divergent populations with other stimulus materials, then their failure to so discriminate in this study may be due to the difference in populations and/or stimulus materials. Therefore, to replicate this study using the same stimulus materials (i.e., old time movie music) with groups who have already demonstrated linguistic differences in response to other types of stimulus materials (i.e., T.A.T. cards) would probably shed some light on whether the non-significant results in the current investigation were a function of the stimulus materials. Another, and perhaps easier investigation of this problem would be to administer T.A.T. cards (which have already demonstrated their ability to elicit differential linguistic scores from more divergent populations) to the same student population employed in this current investigation. The results of such an investigation would suggest if the findings of this present study were a function of the stimulus materials or the population samples.

## CHAPTER VII

### SUMMARY

This study investigated whether selected, formal aspects of linguistic behavior in response to musical stimuli could reflect personality differences in anxiety and repression in a young adult, non-patient population.

The primary hypothesis proposed was that subjects in a normal population with anxiety neurotic and psychopathic personality characteristics as measured by Welsh's Anxiety and Repressor scales can be differentiated by psycholinguistic analysis of responses to musical stimuli. The secondary hypotheses concerned directional predictions of the differences.

Three groups of male Ss were selected from a college population based on their scores on Welsh's Anxiety and Repressor scales on the Minnesota Multiphasic Personality Inventory. These 50 Ss were characterized by their High, Middle, and Low A and R scores. The stimulus materials consisted of seven musical themes which have been used in the past to accompany silent movies. Old time movie music was selected because the various themes seemed to elicit effective responses while at the same time being relatively easy for Ss to respond to. In addition, old time movie music had been used to depict feeling tones rather than specific events. All Ss were asked to write stories that the music suggested to them and linguistic scores were derived from these responses.

The linguistic variables employed were Total Number of Words, Number of Words Per Sentence, Per Cent Personal Pronouns, Per Cent Personal Referents/Total, Per Cent Personal Referents/Personal Pronouns, Per Cent Qualifying Terms, Per Cent Allness Terms, Per Cent Negative Words, Per Cent Adjectives, Per Cent Verbs, Verb/Adjective Quotient, and Type Token Ratio.

Twelve one-way analyses of variance indicated that none of the observed linguistic differences among the three groups departed significantly from chance. Twelve mixed factorial analyses of variance indicated that the three groups did not differ significantly from each other in their linguistic behavior across the seven musical themes. On three of the linguistic variables, however, the three groups collectively demonstrated significantly different linguistic behavior across the seven musical themes at the .05 level. As possible explanations of these findings it was suggested that:

1. The limited range of Ss on the normal/deviant continuum was too restricted to demonstrate differences as have already been demonstrated with clearly divergent groups.
2. Certain properties of the stimulus materials themselves led to stereotypic responses.
3. The relative homogeneity of the populations sampled in terms of sex, age, culture, and educational history may have resulted in Ss who were very much alike on many personality factors and behavioral predilections aside from A and R.

It was speculatively suggested that the more culturally deviant a person is, the more his language may be determined by his personal needs rather than the cultural and/or situational factors present

Proposals for further research were made which would suggest which of these explanations, if any, were influential to the results of this investigation.

APPENDIX A

LETTER OF INVITATION TO SUBJECTS

May 15, 1965

Dear Mr.

As you well know, the University of Florida encourages a great many research projects which depend upon the participation of students requested to serve as subjects. Such an investigation is presently being conducted within the Department of Psychology and selected subjects are urged to participate.

From the tests you took last September, we have determined that you are one of the students whose brief cooperation is necessary for our current research. The particular experiment in which you are urged to be a subject is concerned with the "Psychology of Music". It involves only about 40 minutes of your time and will prove, we are sure, to be of the utmost interest to you personally. The experiment will be held in the Language Laboratory in the basement of Anderson Hall (Near the Library).

We have enclosed a postal card for you to return promptly on which we have indicated your appointment. Also enclosed is a card which you may keep in your wallet as a reminder of time, place, and date. It is important that you keep your appointment, but if it is not possible to do so, contact the project director, Mr. Robert Resnick, for another appointment. He may be contacted in Building E (near Walker Hall), Room 125, or called at Extension 2425.

Again, may we remind you that the prompt return of your postal card within 24 hours is requested. We appreciate your cooperation and will make appropriate note of it.

Yours truly,

Dr. Audrey S. Schumacher  
Professor of Psychology

APPENDIX B

A AND R SCORES AND LINGUISTIC RAW SCORES FOR  
EACH SUBJECT IN THE H, M, AND L GROUPS

A AND B SCORES AND LINGUISTIC RAW SCORES FOR EACH SUBJECT IN THE H, M, AND L GROUPS

Subject	Group	A	B	Linguistic Variables											
				1	2	3	4	5	6	7	8	9	10	11	12
1	B	70	55	610	18.9	10	0	0	0	1	1	24.9	20.0	.80	78
2	B	67	54	502	21.1	6	5	79	2	0	0	24.4	19.6	.81	67
3	B	60	49	630	16.2	11	1	16	0	0	1	20.3	20.9	1.03	73
4	B	61	53	681	17.3	11	0	3	0	1	1	22.3	22.0	.99	70
5	B	62	63	591	14.9	12	0	0	0	1	1	17.6	26.6	1.51	63
6	B	59	61	406	12.7	7	0	0	0	0	1	20.4	24.1	1.19	70
7	B	65	55	501	16.0	4	0	0	1	1	0	20.2	19.2	.68	72
8	B	61	56	568	17.9	6	1	25	1	0	1	28.3	16.0	.57	71
9	B	71	57	561	12.8	5	0	0	0	1	1	22.1	23.5	1.07	66
10	B	70	47	79	14.2	6	6	100	0	6	1	10.1	21.5	2.14	83
11	B	62	51	432	18.8	8	0	0	0	1	1	22.5	18.8	.84	65
12	B	62	55	586	25.5	8	0	0	0	1	2	25.4	18.1	.71	76
13	B	67	49	229	8.5	12	5	41	0	3	3	12.7	30.6	2.41	81
14	B	60	57	601	12.3	5	0	1	0	1	1	16.0	19.5	1.22	68
15	B	70	59	395	16.5	5	0	5	1	2	3	20.8	18.0	.87	71
16	B	67	49	417	18.1	5	1	32	0	2	0	32.9	16.3	.50	69
17	B	65	49	106	10.6	15	0	0	1	0	0	21.7	19.8	.61	61
18	B	72	53	451	15.0	6	0	0	1	0	0	29.3	17.3	.60	75
19	B	67	49	523	18.0	7	0	11	1	0	1	27.7	18.0	.65	72
20	B	60	51	520	15.9	8	0	5	1	1	1	29.4	15.0	.51	74
21	M	50	53	398	18.1	6	0	0	0	1	0	21.9	20.6	.94	70
22	M	49	51	362	14.1	1	0	50	1	2	1	32.2	17.3	.54	72
23	M	50	53	435	15.2	7	1	12	0	1	0	25.1	23.6	.94	67
24	M	50	49	735	11.5	6	0	0	0	0	0	30.5	17.7	.58	73
25	M	50	51	637	19.7	9	7	77	0	1	2	22.2	19.0	.86	72
26	M	49	50	612	12.0	9	3	35	0	0	2	19.9	21.1	1.06	71
27	M	50	47	477	17.2	11	0	0	0	0	1	22.0	21.4	.97	68
28	M	47	47	526	10.1	7	0	0	0	2	1	25.3	22.6	.90	63
29	M	52	49	220	24.4	8	0	0	0	2	2	15.5	26.8	1.74	59
30	M	51	51	520	12.9	6	0	0	0	0	2	20.6	20.6	1.00	69
31	M	51	47	475	33.9	12	0	2	1	1	1	27.2	15.8	.57	71
32	M	50	51	416	14.3	7	0	7	1	1	1	19.2	24.0	1.25	67
33	L	36	38	499	19.7	12	0	0	0	2	1	23.6	18.4	.78	68
34	L	40	40	212	20.3	9	3	33	1	0	2	14.2	27.8	1.97	68
35	L	41	38	724	14.9	4	1	31	1	2	1	27.5	17.5	.64	78
36	L	36	38	172	14.3	8	8	100	2	2	5	16.3	23.8	1.46	64
37	L	36	38	402	17.8	17	1	18	0	0	0	22.6	20.9	.92	68
38	L	42	36	522	13.7	10	4	45	0	0	0	23.9	19.3	.81	66
39	L	44	40	468	19.6	10	2	17	0	1	1	19.7	19.4	.99	73
40	L	40	40	125	11.6	2	0	0	0	2	2	27.4	19.2	.86	69
41	L	46	44	730	22.1	12	1	12	0	1	1	16.0	18.5	1.16	71
42	L	38	40	554	11.3	8	1	17	1	2	1	24.9	20.2	.81	73
43	L	45	32	255	25.5	8	8	100	0	1	0	19.2	25.5	1.33	65
44	L	49	36	456	19.0	4	1	24	0	0	0	33.8	16.7	.49	70
45	L	36	38	647	15.1	9	6	67	0	1	2	22.7	19.3	.65	74
46	L	35	36	552	15.3	9	2	20	0	2	2	17.4	22.1	1.27	67
47	L	49	30	578	10.7	14	0	1	1	1	1	17.1	27.3	1.60	64
48	L	44	38	282	23.5	2	0	0	1	0	0	24.5	18.1	.74	68
49	L	50	38	493	26.0	12	0	2	0	1	1	19.8	20.5	1.04	70
50	L	46	28	494	10.3	10	2	16	0	1	1	22.3	23.3	1.05	70

#### APPENDIX C

HIGH, MID AND LOW GROUP, AND COMBINED GROUP MEANS  
FOR THE THREE SIGNIFICANT LINGUISTIC VARIABLES ACROSS  
MUSICAL THEMES

Mean Scores for Three Linguistic Variables  
Across Musical Themes for the High A and R Group

<u>Musical Themes</u>							
	1	2	3	4	5	6	7
% Pers. Pronouns	4.55	8.85	8.85	7.70	7.10	6.95	7.95
% Adjectives	25.65	24.00	20.20	23.80	22.25	24.35	21.60
% Verbs	17.85	20.30	21.75	20.00	19.20	20.40	22.70

Mean Scores for Three Linguistic Variables  
Across Musical Themes for the Mid A and R Groups

<u>Musical Themes</u>							
	1	2	3	4	5	6	7
% Pers. Pronouns	5.16	8.00	6.75	6.58	7.16	8.33	8.08
% Adjectives	23.41	23.41	24.50	25.00	22.82	23.50	20.66
% Verbs	17.66	20.64	20.83	21.83	23.25	20.66	19.50

Mean Scores for Three Linguistic Variables  
Across Musical Themes for the Low A and R Group

<u>Musical Themes</u>							
	1	2	3	4	5	6	7
% Pers. Pronouns	7.66	9.50	9.11	7.77	7.55	10.22	10.05
% Adjectives	25.66	22.50	22.33	20.27	20.77	21.22	22.00
% Verbs	18.83	22.22	21.16	22.05	21.16	21.22	19.05

Mean Scores for the Three Linguistic Variables  
Across Musical Themes for the High, Mid  
and Low A and R Groups Combined

<u>Musical Themes</u>							
	1	2	3	4	5	6	7
% Pers. Pronouns	5.80	8.88	8.54	7.46	7.22	8.64	8.74
% Adjectives	25.48	23.32	22.00	22.82	21.86	23.02	21.52
% Verbs	18.17	21.06	21.31	21.18	20.88	20.76	20.62

## BIBLIOGRAPHY

Balkan, Eva and Masserman, J. H. The language of phantasy: III The language phantasies of patients with conversion hysteria, anxiety states, and obsessive compulsive neurosis. J. Psychol., 1940, 10.

Berg, I. A. and Adams, H. E. The experimental basis of personality assessment. In A. Bachrach (Ed.), Experimental foundations of clinical psychology. New York: Basic Books, 1962.

Boder, D. F. The adjective-verb quotient. Psychol. Rec., 1940, 3, 310-343.

Brodsky, S. L. Language patterns of repressors and sensitizers in personal and impersonal descriptions. Unpublished doctoral dissertation, U. of Florida, 1964.

Brown, R. W. Linguistic determinism and the part of speech. J. abnorm. soc. Psychol., 1954, 55.

\_\_\_\_\_. Words and things. Glencoe, Ill.: The Free Press, 1958.

Brown, R. W. and Lenneberg, E. H. A study in language and cognition. In S. Saporta (Ed.), Psycholinguistics. New York: Holt, Rhinehart and Winston, 1961.

Busemann, A. Über typisch und phäische unterscheide der categoricalen sprachform. Z. padag. Psychol., 27, as cited in Berg, I. A. and Adams, H. E. The experimental basis of personality assessment. In A. Bachrach (Ed.), Experimental foundations of clinical psychology. New York: Basic Books, 1962.

Carroll, J. B. and Casagrande, J. B. The function of language classifications in behavior. In Maccoby, Newcomb, and Hartley (Eds.), Readings in social psychology. (3rd ed.) New York: Henry Holt, 1958.

Cattell, R. B. and McMichael, R. E. Clinical diagnosis by the IPAT music preference test. J. consul. Psychol., 1960, 24.

Chomsky, N. Review of "verbal behavior" by B. F. Skinner. Language, 1959, 35.

Chotlos, J. W. A statistical and comparative analysis of individual written language samples. Psychol. Monogr., 1944, 56, No. 2 (whole No. 255).

Dahlstrom, W. G. and Welsh, G. S. An MMPI handbook, a guide to use in clinical practice and research. Minneapolis: U. of Minn. Press, 1960.

Eisenson, J. The psychology of speech. New York: F. S. Crofts and Co., 1938.

Fairbanks, Helen. The quantitative differentiation of samples of spoken language. Psychol. Monogr., 1944, 56, No. 2 (whole No. 255).

Fenichel, O. The psychoanalytic theory of neurosis. New York: Norton, 1945.

Greenberg, J. H. Concerning inferences from linguistic to non-linguistic data. In S. Saporta (Ed.), Psycholinguistics. New York: Holt, Rhinehart and Winston, 1961.

Johnson, W. Studies in language behavior. Psychol. Monogr., 1944, 56, No. 2 (whole No. 255).

Korzybski, A. The role of language in the perceptual process. In R. R. Blake and G. V. Ramsey (Eds.), Perception: An approach to personality. New York: Ronald Press, 1951.

Laffal, J. Pathological and normal language. New York: Atherton Press, 1965.

Lindquist, E. F. Design and analysis of experiments in psychology and education. Boston: Houghton Mifflin, 1953.

Lorenz, Maria. Language behavior in psychoneurotic patients. Arch. Neurol. Psychiat., 1953, 69.

Lorenz, Maria and Cobb, S. Language behavior in manic patients. Arch. Neurol. Psychiat., 1953, 69.

\_\_\_\_\_. Language behavior in psychotic and neurotic subjects. Arch. Neurol. Psychiat., 1954, 72.

Mann, Mary B. The quantitative differentiation of samples of written language. Psychol. Monogr., 1944, 56, No. 2 (whole No. 255).

Nunnally, J. Individual differences in word usage. In S. Rosenberg (Ed.), Directions in psycholinguistics. New York: The Macmillan Co., 1965.

Osgood, C. E. and Seboek, T. A. (Eds.) Psycholinguistics: A survey of theory and research problems. International Journal of American Linguistics, 1954, 20, No. 4. Also supplement to J. abnorm. soc. Psychol., 1954, 49.

Osgood, C. E., Suci, G., and Tennebaum, P. The logic of semantic differentiation. In: Measurement of Meaning. Urbana: U. of Ill. Press, 1957, as reprinted in S. Saporta (Ed.), Psycholinguistics, 1961.

Osgood, C. E. and Walker, Evelyn. Motivation and language behavior: A content analysis of suicide notes. J. abnorm. soc. Psychol., 1959, 59.

Rubenstein, H. and Aborn, M. Psycholinguistics. In Annual review of psychology, 11. Palo Alto, Calif.: Annual Reviews, Inc., 1960.

Sapir, E. Language. New York: Harcourt, Brace and Co., 1921.

\_\_\_\_\_. The status of linguistics as a science. Language, 1929, 5.

Skinner, B. F. The verbal summator and a method for the study of latent speech. J. of Psychol., 1936, 2, 71-107.

\_\_\_\_\_. A functional analysis of verbal behavior. In S. Saporta (Ed.), Psycholinguistics. New York: Holt, Rhinehart and Winston, 1961.

Stone, D. R. The Auditory Apperception Test. Western Psychological Services, 1953.

Webster's New Collegiate Dictionary. Springfield, Mass.: G. & C. Merriam Co., Publishers, 1961.

Welsh, G. S. and Dahlstrom, W. B. Basic readings on the MMPI in psychology and medicine. Minneapolis: U. of Minn. Press, 1956.

Whorf, B. L. Language, thought, and reality. Boston: Institute of Technology, 1956.

\_\_\_\_\_. Science and linguistics. In S. Saporta (Ed.), Psycholinguistics. New York: Holt, Rhinehart and Winston, 1961.

Zipf, G. K. Psycho-biology of language. Boston: Houghton Mifflin Co., 1935.

#### BIOGRAPHICAL SKETCH

Robert William Resnick was born on July 10, 1937, at New York City, New York. He attended Far Rockaway High School and in 1955 was graduated from Croton-Harmon High School in Croton-on-Hudson, New York. From 1955 to 1961 he attended the City College of New York and in 1961 received a Bachelor of Arts degree in Psychology. From 1961 to 1963 he attended Columbia University, where in 1962 he received a Master of Arts degree in Psychology. From 1963 to the present he has been a graduate student at the University of Florida. He was employed as a graduate research assistant in the University Counseling Center from January, 1964, to June, 1964. During the Summer of 1964 he was employed as an Instructor in Project CAUSE. During the academic year 1964-1965 he held a USPHS Fellowship. In 1965-1966 he interned in clinical psychology at the U.C.L.A. Neuropsychiatric Institute. From September of 1966 to the present he has been an Assistant Counseling Psychologist in the University Counseling Center at the University of Florida.

Robert William Resnick is married to the former Elizabeth Alba Ann Estrup. They have a three-year-old son, Christopher, and currently reside in Gainesville, Florida.

This dissertation was prepared under the direction of the chairman of the candidate's supervisory committee and has been approved by all members of that committee. It was submitted to the Dean of the College of Arts and Sciences and to the Graduate Council, and was approved as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

December 1967

  
\_\_\_\_\_  
E. Ruffin Jones  
Dean, College of Arts and Sciences

\_\_\_\_\_  
Dean, Graduate School

Supervisory Committee:

A. Schumacher  
Chairman  
C. Richard Levy  
D. Jordan  
Henry Barnes  
Ben Barger  
R. J. Anderson

6376A